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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,624	04/14/2004	T. Douglas Mast	END-5044	6257

7590 11/16/2006

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EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3768

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/824,624

Applicant(s)

MAST ET AL.

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 12-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 12-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 3, 5, 8, 12-18, 20 - 24 as amended are rejected under 35 U.S.C. 103(a) as obvious over O'Donnell et al (US5453575), further in view of Grunwald et al (US6254543, of record) or Jang et al (US5383460). O'Donnell et al as noted in the earlier action teaches that the image contaminant effect of tissue and blood visualization on each other may be reduced by receiving and subtracting one or more image sample sets M (col. 22 lines 4 – 37) to provide a standardization for selective

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emphasis of blood or slow moving or stationary tissue, each of the standardizing sets or the plural sets being characterizable as 'at least two reference signals' either in the sense of pixels within a frame or in the sense of plural frames, and which are subtracted to derive a contaminant-free signal which is then imaged, M being an averaging index which when greater than two serves as an iteration or update index, the balanced sine cosine taper amplitude modulation described in col. 25 lines 11 – 33 providing a weighting thereto, the resulting image being displayed as the imaging catheter is moved with respect to the surrounding lesion. Zero values may be set initially into the Wallace adder by the operator or result when a new measurement is begun. With respect to claim 20, O'Donnell et al pertains to compositing based upon both the tissue (calibration correction basis for bloodflow) and the corrected or bloodflow image.

Whereas O'Donnell et al does not teach motion of the transducer in accordance with deriving reference signals, it would have been obvious in view of Grunwald et al col. 3 lines 26 – 30 to use a moving transducer in the IVUS application. Hence while Grunwald et al per se is directed to an alternative to reference scan subtraction, it reveals that the artisan considered ringdown artifact as associated both mechanical scan transducers as well as electronic array sources. Alternatively, Jang et al discusses artifact line 200 image wide as accompanying an IVUS image obtained by a mechanical (longitudinal) scan, and therefore the artisan would have recognized that reference signal subtraction solutions would pertain to images obtained by mechanical transducer movements.

Claims 1 – 8, 12 - 24 are rejected under 35 U.S.C. 102a as obvious over Wu et al (US6036650) in view of Grunwald et al or Jang et al.

Wu et al is directed to an enhanced ringdown and main bang and probe surface saturation corona elimination scheme where reference frame data subtraction is performed as a weighted average across multiple frames with weighting adapted in an alternative method to account for greater offset for motion location change or other source of decorrelation or drift such as temperature and with initial and operator set zeroing via weight contribution and threshold levels, see cols. 6 and 7 and col. 2 lines 7 – 8. Whereas Wu et al does not teach reference signal obtainance in association with mechanical transducer movement, it would have been obvious in view of the latter to extend ringdown cancellation procedures to mechanical scan protocols for reasons paralleling those set forth above.

Claims 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Donnell et al in view of Grunwald et al or Jang et al as argued above, further in view of Phillips et al (US6632177). Whereas the former as applied above is silent as to weighting assigned in accordance with movement and correlation changes, it would have been obvious in view of the latter element 18 and col. 9 lines 4 – 41 to use motion/correlation changes as a basis for difference imaging soas to emphasize bloodflow in images, particularly where contrast agent is additionally used.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al in view of Grunwald et al or Jang et al as applied to claim 1 above, and further in view of

Hassler (US5245586), since whereas the former is silent as to compensation for intervening structure except for the recognition of the transducer boundary surface as bounding the ringdown, it would have been obvious in view of the latter's inventive summary to consider both the transducer – tissue transition materials or mismatch characteristics of intervening tissues as a source of artifact to be compensated for by offsetting compensation whereupon it would have been inherently obvious to consider respiratory tissue and motion thereof as such an artifact source.

Response to Arguments

Since it was known to perform intravascular scanning by relative mechanical movement of the ultrasound transducer and with the same ringdown problem as evidenced by the secondary teachings, the Examiner's position is that it would have been obvious to apply a corrective reference signal set such as a frame, since this term is otherwise broader than the term calibration as discussed in the earlier office action.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

11-10-06



Francis J. Jaworski

Primary Examiner

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